RESTRICTED CIRCULATION

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Agricultural Memorandum No 438

Work Days in the spring - C V Smith

1. Relationships between weather and days when field cultivations in the spring can proceed, are set down in earlier memoranda (Ag Mem 168, 182, 211), together with cumulative frequency curves of the time available for work in a typical sample of years on differing soil types.

To make the data more informative for both the strategy and tactics of field working, these are now restated in the form shown in Tables 1, 2, 3. The original data for 22 years at both Lincoln and Cambridge have been re-examined to give the number of days required, from mid-February, to achieve a given number of work days. The data were broken down into decile ranges. The tables represent the upper values of those found in each range.

2. The data are still in a form suitable for long-term forward planning, but a question always of topical interest is the number of days likely to be available for work in the current season.

In other words, the data now are suitable for a direct introduction into a PERT (Programme Evaluation and Review Technique). Does the possibility in fact exist of revising the long-term estimate of the work days likely to be available, in the light of the weather expectations for the months (and season) ahead?

To this end, an analysis is given in Tables 4, 4(a), 5, 5(a) of the number of work days as a function of the associated monthly rainfall, expressed as a percentage of the long period average. Despite the variability shown there are obviously underlying trends. These are brought out by the mean work days available in each of the tercile ranges of the distribution of percentage rainfall.

If it were possible to indicate the rainfall category (Average, above or below average) for the month ahead in the spring, then this would obviously represent useful comment.

The degree of success of such rainfall forecasts in recent years has been summarised by Ratcliffe (1970).

Reference

Ratcliffe, R A S 1970. Meteorological Office Long Range Forecasts: Six years of progress. Met. Mag. Vol 99, No 1174, pp 125-30.

Meteorological Office
Cambridge
March 1972

Days from mid-February to achieve given number of work days in typical sample of years

Table 1

Cambridge Light Soil

WD	5	10	15	20	25	30	35	40	45	50	55	60	65	70
Year 1	8	13	18	23	28	35	40	45	50	57	62	68	73	75
2	8	13	20	25	30	35	40	46	52	58	64	69	74	>75
3	8	15	20	27	32	37	42	48	55	60	67	72	>75	.
4	10	15	22	27	33	38	43	52	57	62	67	72	.	.
5	11	17	23	30	35	42	47	53	59	65	70	>75	.	.
6	12	17	25	32	37	43	48	55	62	67	72	>75	.	.
7	13	18	25	32	38	45	52	58	63	68	73	>75	.	.
8	13	21	27	32	40	48	55	60	66	71	>75	.	.	.
9	16	22	28	42	49	54	59	64	71	>75	.	.	.	.
10	18	23	28	63	68	73	>75	>75	>75	.	.	.	.	.

Lincoln Light Soil

WD	5	10	15	20	25	30	35	40	45	50	55	60	65	70
Year 1	8	13	20	26	31	36	41	48	55	62	67	72	>75	>75
2	9	14	21	26	33	38	45	52	59	64	69	75	>75	.
3	9	15	22	28	34	40	45	54	60	65	70	75	>75	.
4	10	16	23	29	35	40	45	55	60	65	70	>75	.	.
5	10	16	24	30	35	41	48	56	61	67	73	>75	.	.
6	11	18	25	32	37	46	51	57	62	70	>75	.	.	.
7	13	20	29	35	41	48	53	61	66	71	>75	.	.	.
8	15	20	31	36	41	51	56	66	71	>75	.	.	.	.
9	20	25	34	43	52	57	62	67	72	>75	.	.	.	.
10	24	49	61	59	64	69	74	>75	>75	.	.	.	.	.

Combined Cambridge Lincoln Data

Light Soil

WD	5	10	15	20	25	30	35	40	45	50	55	60	65	70
Year 1	8	13	18	25	30	35	40	45	51	57	63	68	73	>75
2	8	14	20	26	32	37	42	48	55	62	67	72	>75	.
3	9	15	21	27	33	38	45	52	58	64	69	75	>75	.
4	10	16	23	29	35	40	45	54	60	65	70	75	>75	.
5	11	16	24	30	35	42	48	55	61	66	71	>75	.	.
6	11	18	25	32	37	45	51	57	62	68	73	>75	.	.
7	13	20	27	33	40	48	53	58	65	71	>75	.	.	.
8	15	21	28	36	41	51	56	63	69	>75	.	.	.	.
9	17	23	31	43	51	56	61	67	72	>75	.	.	.	.
10	24	49	61	63	68	73	>75	>75	>75	.	.	.	.	.

Days from mid-February to achieve a given number of work days in a typical sample of years

Table 2

Cambridge Medium Soil

WD	5	10	15	20	25	30	35	40	45	50	55	60	65
Year 1	9	14	20	25	30	37	42	48	56	61	67	72	75
2	10	15	22	27	32	38	43	50	58	63	71	75	>75
3	12	17	22	28	35	40	45	54	61	67	72	>75	.
4	12	17	26	32	38	44	49	57	63	70	75	>75	.
5	13	22	28	33	39	47	52	60	65	72	>75	.	.
6	14	23	28	34	42	49	55	62	67	73	>75	.	.
7	15	24	30	36	45	52	57	64	69	75	>75	.	.
8	18	25	31	37	49	54	62	68	73	>75	.	.	.
9	19	26	32	51	56	61	71	>75	>75	.	.	.	.
10	21	27	45	65	70	>75	>75	.	.	.	.	.	.

Lincoln Medium Soil

WD	5	10	15	20	25	30	35	40	45	50	55	60	65
Year 1	9	14	22	27	32	37	43	55	61	66	71	>75	.
2	11	16	23	28	36	41	48	56	63	68	71	>75	.
3	11	18	25	30	37	42	52	58	64	70	>75	.	.
4	12	19	28	33	38	44	53	59	67	72	>75	.	.
5	13	20	28	33	41	47	57	62	68	73	>75	.	.
6	15	23	30	35	42	48	57	62	69	>75	.	.	.
7	16	24	31	36	43	50	58	63	73	>75	.	.	.
8	18	28	34	39	46	52	64	69	>75	.	.	.	.
9	25	31	45	54	59	64	69	74	>75	.	.	.	.
10	45	52	57	62	67	72	>75	>75	.	.	.	.	.

Combined Cambridge Lincoln Data

Medium Soil

WD	5	10	15	20	25	30	35	40	45	50	55	60	65
Year 1	9	14	20	25	30	37	42	48	56	61	68	73	>75
2	10	16	22	27	33	38	45	55	61	66	72	>75	.
3	11	17	23	30	37	42	49	57	63	69	75	>75	.
4	12	18	27	33	38	44	52	59	65	70	>75	.	.
5	13	22	28	33	41	47	55	61	67	73	>75	.	.
6	15	23	29	35	42	49	57	62	69	74	>75	.	.
7	16	24	31	36	45	51	58	64	71	>75	.	.	.
8	18	26	32	39	49	54	63	69	71	>75	.	.	.
9	21	28	45	54	59	64	71	>75	>75	.	.	.	.
10	45	52	57	65	70	>75	>75	.	.	.	.	.	.

Days from mid-February to achieve a given number of work days in a typical sample of years

Table 3

Cambridge Heavy Soil

WD	5	10	15	20	25	30	35	40	45	50	55
Year 1	11	16	22	27	34	39	45	55	60	68	73
2	12	17	24	30	35	40	48	57	62	69	74
3	13	18	25	33	38	43	50	60	65	71	>75
4	15	20	29	34	42	48	58	63	68	73	>75
5	15	24	31	36	44	53	59	64	69	74	>75
6	17	26	32	37	47	54	60	65	70	75	.
7	20	27	33	42	49	56	66	71	>75	.	.
8	22	28	35	51	56	62	67	75	>75	.	.
9	22	31	53	58	63	71	>75	>75	.	.	.
10	26	62	67	75	>75	>75	.	.	.	.	.

Lincoln Heavy Soil

WD	5	10	15	20	25	30	35	40	45	50	55
Year 1	11	16	23	28	33	38	54	61	66	72	75
2	12	18	25	32	40	46	57	63	73	75	.
3	13	21	30	35	41	49	62	68	74	75	.
4	14	25	32	39	44	57	63	68	>75	.	.
5	17	28	33	42	48	58	65	70	>75	.	.
6	22	30	38	43	53	60	69	75	>75	.	.
7	23	33	38	46	55	64	70	>75	.	.	.
8	25	38	45	52	59	67	74	>75	.	.	.
9	33	51	56	61	66	71	>75	.	.	.	.
10	67	73	>75	>75	>75	>75	.	.	.	.	.

Combined Cambridge Lincoln Data

Heavy Soil

WD	5	10	15	20	25	30	35	40	45	50	55
Year 1	11	16	22	27	33	38	45	55	60	.	
2	12	17	35	30	37	42	53	61	66	.	
3	13	19	28	33	41	46	57	63	69	.	
4	15	24	30	36	44	49	59	65	72	.	
5	17	26	32	39	45	54	63	68	75	.	
6	19	27	33	42	49	58	66	71	>75	.	
7	22	29	36	45	55	62	69	75	>75	.	
8	23	33	38	52	57	65	71	>75	.	.	
9	26	46	56	61	66	71	>75	.	.	.	
10	68	73	>75	>75	>75	>75	.	.	.	.	

Table 4 Cambridge data

February				March				April			
Monthly rainfall % of average	Number of work days L	M	H	Monthly rainfall % of average	Number of work days L	M	H	Monthly rainfall % of average	Number of work days L	M	H
222	1	0	0	270	12	8	4	241	15	12	11
198	2	0	0	195	17	17	16	215	23	17	16
189	3	1	0	194	14	14	9	162	24	16	15
154	6	1	0	193	18	15	10	142	27	26	26
144	5	1	0	183	19	19	17	139	26	24	22
127	6	5	2	160	20	18	16	127	22	18	14
123	7	4	2	129	22	19	17	121	28	18	15
117	8	6	3	111	18	17	16	118	24	20	19
113	6	5	4	105	27	25	24	115	27	19	17
109	9	7	6	100	27	24	21	114	26	24	21
105	7	6	4	84	24	23	18	95	27	24	24
90	11	10	7	81	23	22	20	91	25	25	24
81	12	11	10	71	28	27	26	88	28	25	23
79	8	0	0	51	31	25	25	87	25	25	23
59	8	7	5	48	29	28	27	70	27	21	20
52	10	8	5	40	29	27	26	64	30	28	27
52	12	6	3	37	29	28	27	63	27	26	25
51	12	11	8	37	29	28	27	58	30	30	30
47	11	9	8	32	27	27	25	38	30	30	30
47	10	9	8	32	31	31	30	21	29	27	25
30	12	11	9	31	29	29	28	21	29	28	27
8	12	11	10	13	31	31	31	7	30	30	30

Table 4(a)

Mean number of work days in each tercile rainfall range

Tercile Range	February			March			April		
	L	M	H	L	M	H	L	M	H
Upper	4	2	0	16	16	13	24	19	17
Middle	9	7	5	27	25	22	26	23	21
Lower	11	9	7	29	28	27	29	28	28

L = Light Soil
M = Medium Soil
H = Heavy Soil.

Table 5 Lincoln Data

February				March				April			
Monthly rainfall % of average	Number of work days L	M	H	Monthly rainfall % of average	Number of work days L	M	H	Monthly rainfall % of average	Number of work days L	M	H
233	1	0	0	279	7	6	3	152	20	15	14
193	0	0	0	233	18	15	9	147	15	15	10
174	4	0	0	211	8	5	0	147	22	18	14
174	0	0	0	175	18	18	13	119	24	20	10
140	6	3	0	136	17	16	13	111	18	18	18
128	9	8	1	134	23	21	19	107	24	23	21
126	4	3	0	131	20	18	16	104	25	24	23
117	6	4	0	103	23	23	15	103	21	17	15
115	4	2	0	99	26	26	13	97	28	21	18
105	10	8	5	92	24	21	20	89	19	19	17
105	8	6	5	91	25	25	21	82	28	18	12
98	9	6	0	89	24	23	21	73	29	28	12
90	8	7	6	73	29	25	23	69	30	23	17
69	8	6	3	71	24	24	21	69	26	23	20
62	9	4	3	66	28	28	26	67	27	23	20
60	11	10	9	66	27	26	24	62	28	22	19
49	11	7	6	53	28	27	27	59	25	19	17
35	12	11	9	52	27	27	24	58	27	26	25
32	11	10	9	37	30	29	27	57	30	29	28
24	11	9	8	36	29	29	28	31	28	28	27
24	10	10	8	32	31	31	31	10	30	30	30
20	10	8	7	18	31	31	31	7	29	29	27

Table 5(a)

Mean number of work days in each tercile rainfall range

Tercile Range	February			March			April		
	L	M	H	L	M	H	L	M	H
Upper	3	2	0	16	14	9	21	19	16
Middle	8	5	3	25	24	20	26	23	16
Lower	11	9	8	29	29	27	28	26	25

L = Light Soil
M = Medium Soil
H = Heavy Soil